



MSWBT2213 MoreSense WiFi&BLE Module User Manual V1.2



RevisionHistory

Revision	Description	ReleaseDate
V1.0	MSWBT2213 UserManualInitialVersion	
V1.1	RevisedTheDimension	2022- 1- 12
V1.2	ModifiedTheModule'sBackSideAppearance	2022-2-23

ProprietaryStatement:

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1 Product Description

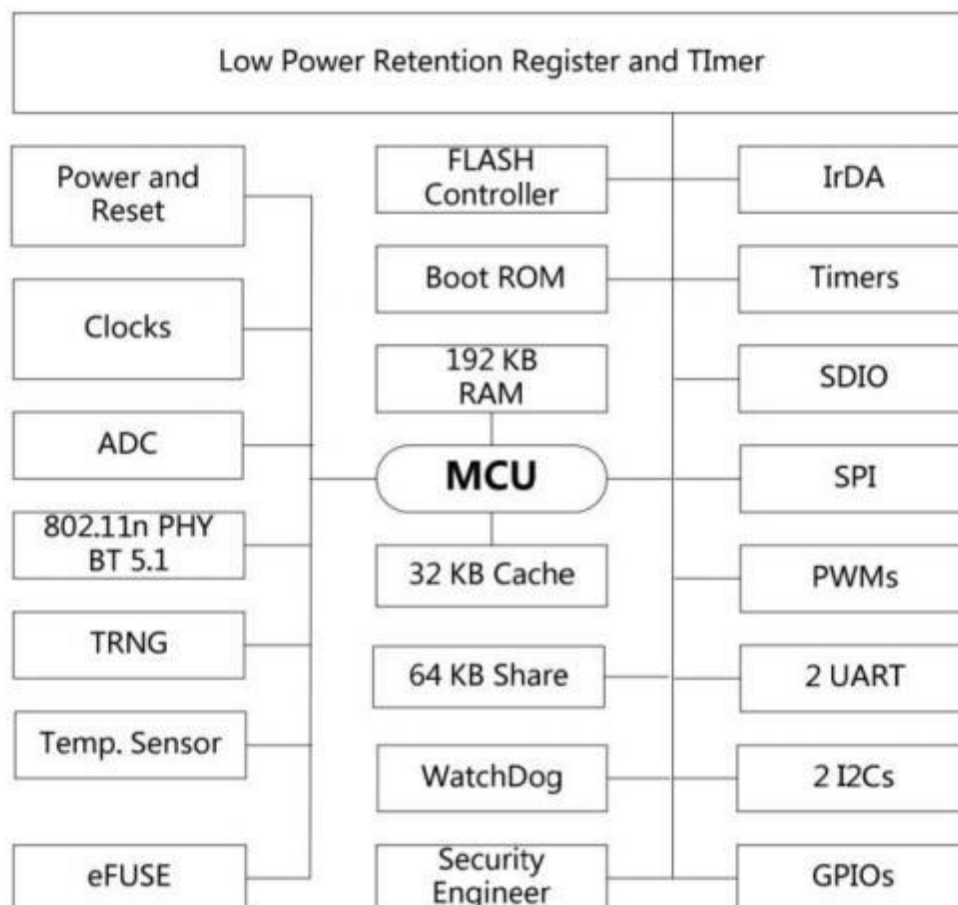
MSWBT2213 is a chip that integrates Wi-Fi 802.11b/g/n and BLE 5.2 dual-mode wireless communication. The chip integrates hardware and software resources required to complete a Wi-Fi and Bluetooth application, and can support dual-role connections of AP and STA, as well as classic Bluetooth and low-power Bluetooth connections. A 32-bit MCU running at speeds up to 120 MHz and built-in 256 KBRAM enable the chip to support multi-cloud connectivity, and the MCU's extended instructions for signal processing allow it to efficiently encode and decode audio.

Physical Map

Built-in Antenna:



2 System Block Diagram



3 Product Features

- . Complies with 802.11 b/g/n 1x1;
- . 20 MHz bandwidth and STBC;
- . Support for STA, AP, APSTA and Direct modes;
- . UART or SPI download, 50 MHz clock frequency SDIO, high-speed SPI interface, dual I2C interface
- . Six channels supporting PWM outputs with high-speed clocks or low-power clocks; Six channel high-speed 10-bit multichannel ADCs, and internal filtering to 16-bit;
- . Embedded eFUSE and support for OTP read and write within FLASH, which can be used to provide a unique serial number, code encryption, and secure debug interfaces. A true random number generator and security module are integrated internally to ensure secure communication and fast authentication and network connectivity.. Distinguishes between power-on reset and WDT-reset
- . Every 2 PWMs can be configured for phase-controllable differential mode to support motor and strip drive;
- . 32-bit single-core processor with main frequencies up to 120 MHz;
- . 256 KB ROM ;
- . Embedded flash 2M.

4 KeyApplication

- SecurityandSmartSurveillance: Cameras...
- SmartHome: smartlighting, smartbuttons, smartsockets, indoorpositioning
- IndustrialAutomation: industrialrobots, Meshnetworking, human- machineinterface, industrialbus applications
- Healthcare: healthmonitoring, babymonitor
- ConsumerElectronics: smartwatches, smartbands – OTTTVboxes, settopboxdevices – Wi- Fi andBluetoothspeakers, toyswithdatauploadandproximitysensingtoys
- SmartAgriculture: smartgreenhouse, smartirrigation, agriculturalrobots
- RetailCatering: POSsystems, servicerobots, cloudprinters
- UniversalLow-poweredIoTdatalogger

5 ParameterforMSWBT2213

Type	Parameter	Value
WIFI Parameter	CertificationStandards	FCC/CE/SRRC/RoHS
	WirelessStandards	802. 11 b/g/n(20/40)
	FrequencyRange	2.412GHz-2.472GHz
	TransmitPower	802. 11b: + 16dBm(@11Mbps)
		802. 11g: + 13dBm(@54Mbps)
		802. 11n(20/40): + 12dBm(@HT20,MCS7)
	ReceiverSensitivity	802. 11b: -87dBm (@11Mbps,CCK)
		802. 11g: -76dBm (@54Mbps,OFDM)
		802. 11n: -72dBm (@HT20,MCS7)
		MSWBT2213:

	Antenna	Built-in: PIFA Antenna
Bluetooth Parameters	WirelessProtocol	BLE5.2
	FrequencyRange	2.402GHz-2.480GHz
	TransmitPower	<=5dbm
	ReceiverSensitivity	-90dBm
Hardware Parameters	DataInterface	UART
		GPIO, SPI
	OperatingVoltage	3.0~3.6V
	WorkingCurrent	Peak(continuoustransmission): 260mA Average(STA,connectedandstandby): 24mA (DTIM1) Average (STA, 1KB/s): 54mA Average (AP): 85mA
	OperatingTemperature	-40C- 85C
	StorageTemperature	-40C- 125C
	Humidity	<85%
	DIM.	MSWBT2213: 22mmx 13.5mmx 3mm
	WirelessNetworkType	STA/AP/AP+STA/BLE5.2
	SecurityMechanism	WEP/WPA-PSK/WPA2-PSK



Software Parameters	EncryptionType	WEP64/WEP128/TKIP/AES
	UpgradeFirmware	LocalWireless RemoteUpgrading
	Customization Development	ProvideSDKforcustomer's 2nddevelopment
	NetworkProtocol	IPv4, TCP/UDP/HTTP/MQTT
	UserConfiguration	AT+ commandset, Webpage Android/ iOSTerminal SmartLinksmartconfigurationAPP

6 PinDefinition

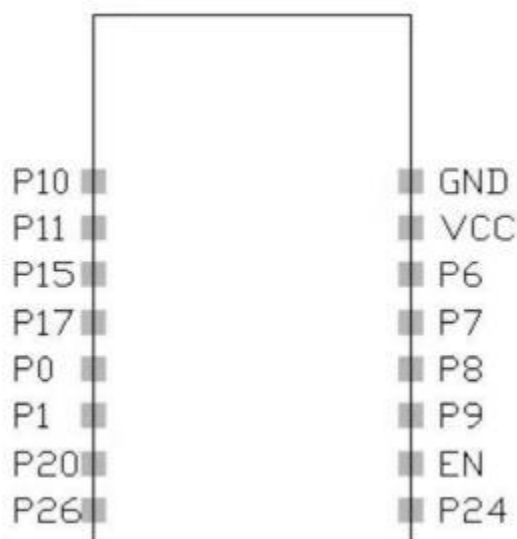


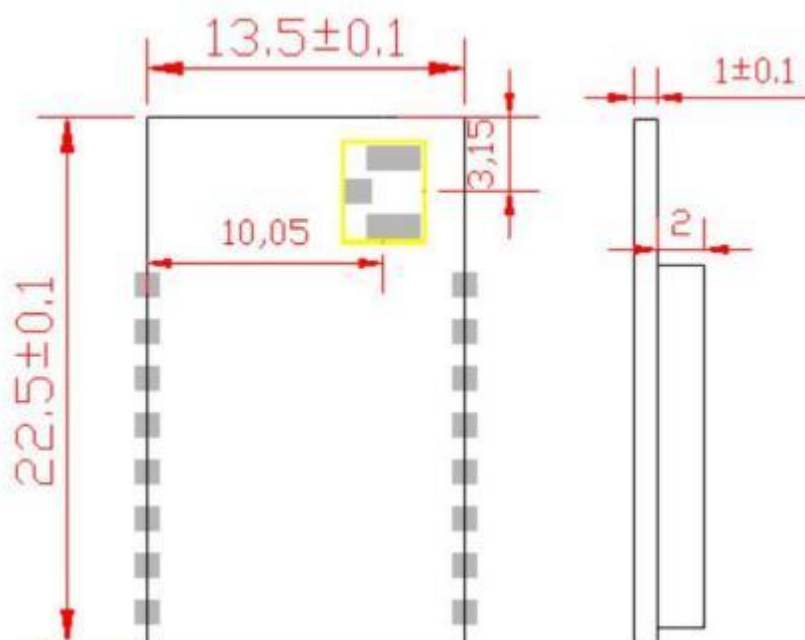
Table.1MSWBT2213PinFunctionDefinition

Pin	Name	Type	Description
1	P10	I/O/T	Ifitdoesnotuse-NC
2	P11	I/O/T	Ifitdoesnotuse-NC
3	P15	I/O/T	Ifitdoesnotuse-NC
4	P17	I/O/T	Ifitdoesnotuse-NC
5	UART0	O	3.3VCommunicationSerialPort 0 Output P0
6	UART0	I	3.3VCommunicationSerialPort 0 Input P1

7	UART0_CTS	I/O/T	If it does not use- NC
8	UART0_RTS	I/O/T	If it does not use- NC
9	P24	I/O/T	If it does not use- NC
10	ModuleReset	I	Low active hardware reset input pin, there has internal reset circuit, external pull-up resistance is not allowed, avoiding prolong the reset time and cause abnormal startup.
11	P9	I/O/T	"0" - complete startup; "1" - do not complete startup; if it does not use- NC P9
12	P8	I/O/T	If it does not use- NC
13	P7	I/O/T	If it does not use- NC
14	P6	I/O/T	If it does not use- NC
15	+3.3V Power Supply	Power	If it does not use- NC
16	Ground	Power	

I: Input O: Out T: It can be set as high impedance.

7 Module Dimension



Unit: Millimeter (mm)

8 Name Rules

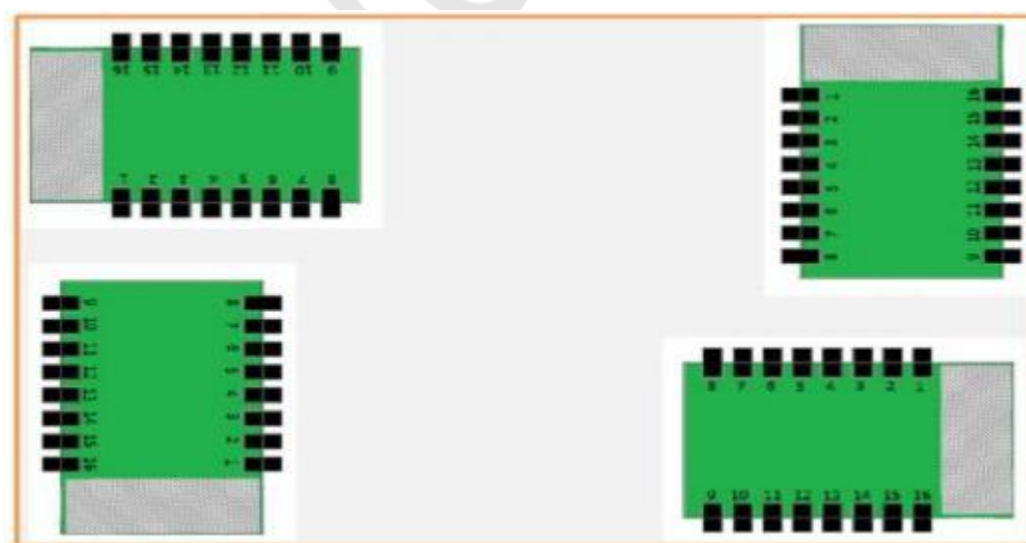


9 Precautions

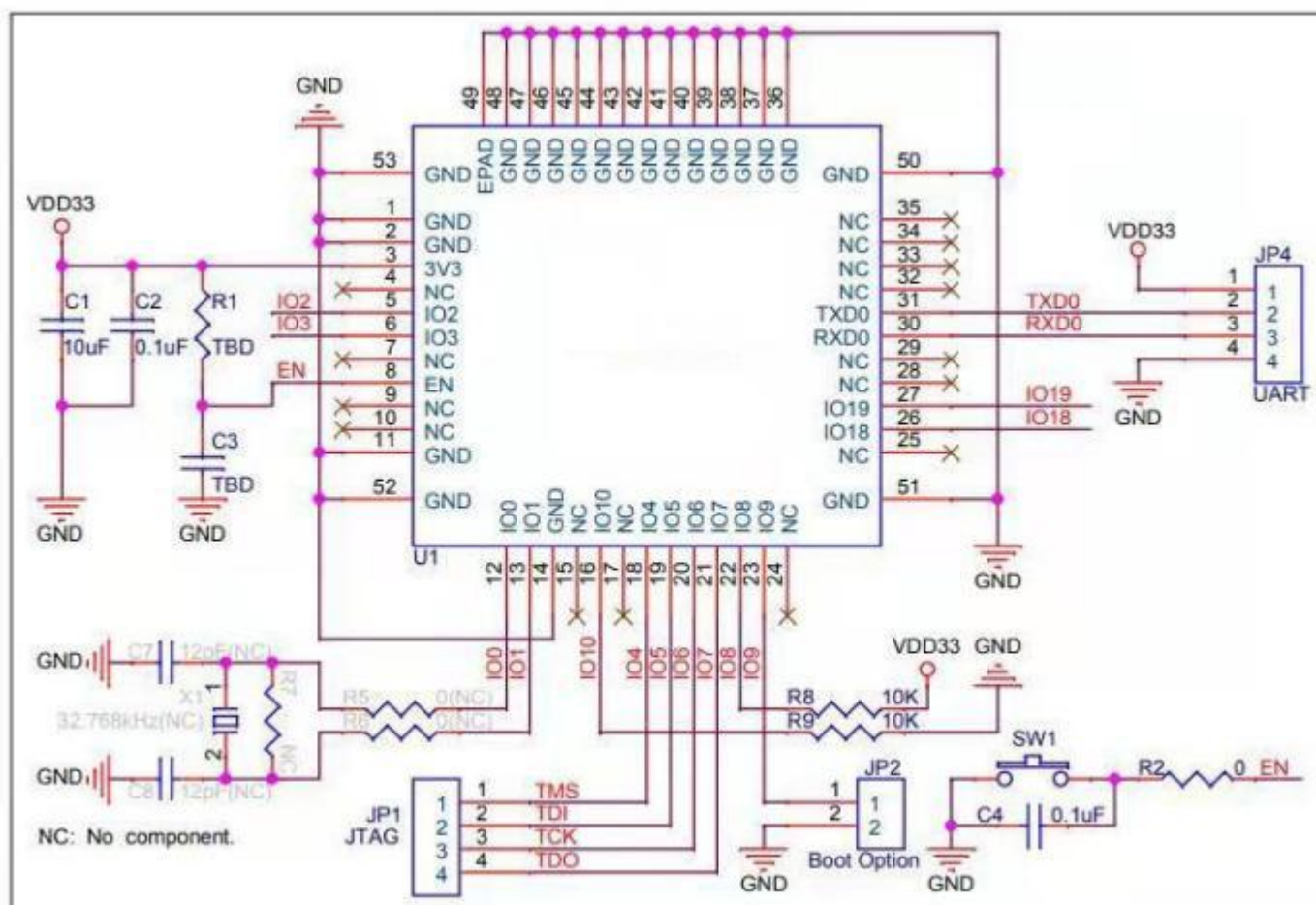
Precautions

MSWBT2213 supports built-in antenna option. When customers choose built-in antennas, they need to observe the following precautions for built-in antennas and general rules for modules placement:

- . On the user's PCB board, there are corresponding to the strip area (MSWBT2213: 22.5x13.5mm) in the picture above cannot place components and lay GND;
- . The antenna should be kept away from metal at least 10mm away from the surrounding high components;
- . The antenna part cannot be blocked by the metal casing, and the plastic casing needs to be at least 10mm away from the antenna;
- . MoreSense recommends that the MSWBT2213 module be placed in the following areas of the user board, which aimed to reduce the impact on the antenna and wireless signals. At the same time, please ask MoreSense for technical support to assist in the placement of the module and the layout design of related areas.



1 0 HardwareTypicalApplication



1 1 PackageInformation

1 1 . 1 RecommendedReflowSolderingProfile

Figure1. ThermalReflowProfile

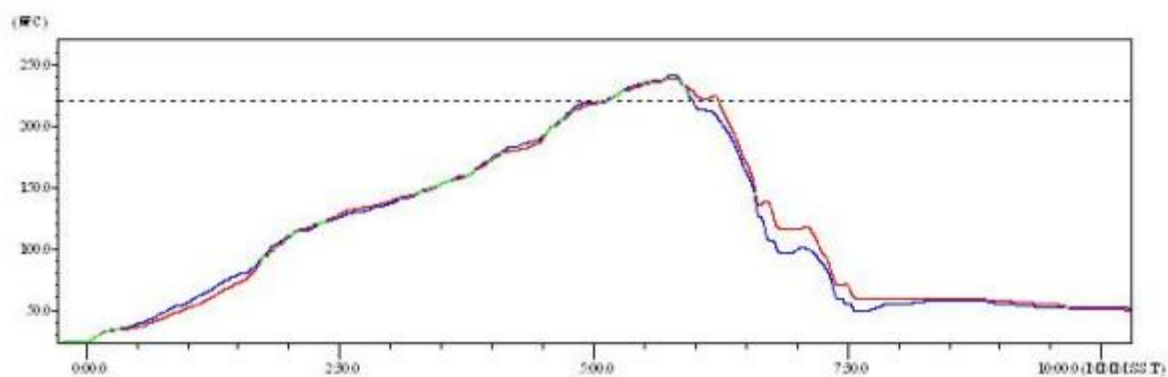


Table1. ReflowData

No.	Program	Temp. (°C)	Time(S)
1	Re- fluxingTime	Above 220 °C	35~55S
2	PeakTemp.	Highest260 °C	

Note: :

1. It is recommended to use an nitrogen re-flux furnace;
2. The oxygen content is less than 300ppm.

11.2 Instruction

A. Sealed storage period: 12 months in an environment with a temperature of less than 30 °C and a relative humidity of less than 60%.

B. Bake before using if the window time exceeds 168 hours after unpacking.

C. Recommended to use nitrogen filling method for baking.

D. Recommended to use nitrogen filling method.

E. Baking and rework requirements for this model: 125 ±5 °C , 24 hours.

F. Recommended storage conditions ≤ 10%, relative humidity under vacuum packaging.

G. If the SMT process requires stop as twice reflow ovens:

① TOP Surface ② BOT Surface

Situation 1: The WIFI module is designed on the TOP surface of the customer's PCB. The TOP surface needs to be baked when the TOP surface has not been produced after the BOT surface has been finished 168 hours (window time).

Situation 2; The WIFI module is designed on the BOT side of the customer's PCB and follows the normal baking rules.

Note: The window time means 168 hours from the end of the last baking to the beginning of the next reflow.

11.3 MSWBT2213 Package Method

Reel Packaging

Dim.: 340*340*50 mm



instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01**2.2 List of applicable FCC rules**

The MSWBT2213 is an BT Module with GFSK modulation and WIFI Module with DSSS and OFDM. BT module operates on the 2402MHz~2480MHz band and WIFI Module operates on the 2412MHz~2462MHz.

FCC part 15.247 standard

2.3 Specific operational use conditions

The EUT is a BT/WIFI Module

BT/WIFI Antenna Type: PCB Antenna

BT/WIFI Antenna gain: 1.5dBi

The module can be used for mobile or applications with the maximum Ant 1.5dBi; The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in this manual.

2.4 Limited module procedures

not applicable; Single Modular Approval Request

2.5 Trace antenna designs

Not applicable;

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

2.7 Antennas

The MSWBT2213 is an BT/WIFI Module beams signals and communicates with its antenna, which is PCB Antenna. The PCB Antenna gain is 1.5dBi. The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.8 Label and compliance information

The final end product must be label in a visible area with the following

Host must Contains FCC ID: 2A86J-MSWBT2213.

2.9 Information on test modes and additional testing requirements

Data transfer module demo board can control the EUT work in RF test mode at specified test channel.

2.10 Additional testing, Part 15 Subpart B disclaimer

The module without unintentional-radiator digital circuit, so the module does not required an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.

ATTENTION

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) This device and its antenna(s) must not be co - located with any other transmitters except in accordance with FCC multi - transmitter product procedures. Referring to the multi - transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2P.
- 3) For all products market in US, OEM has to limit the Operating Frequency: 2412-2462 MHz /2402-2480MHz by supplied firmware programming tool. OEM shall not supply any tool or info to the end - user regarding to Regulatory Domain change.

FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.